



### Objective:

Upon completion of this unit the student will possess a working knowledge of the NFPA recommended procedures for the care, maintenance and testing of cotton-jacket, lightweight and rubber booster hose.

## I. Introduction

### A. The importance of reliable fire hose

1. Essential for the protection of firefighters on the fireline
2. Can mean the difference between controlling or losing the fire if a hose breaks

### B. Must ensure that all hose on the engine is in good condition

1. The life of the hose is determined by how well it is cared for

## II. Types of Fire Hose

### A. Linen or unlined cotton/synthetic

1. Linen hose susceptible to mildew
2. Very porous
  - a. Leaks until saturated then stays wet
3. Used for specialized needs
  - a. Around coals, embers, or flame
  - b. In buildings for standpipe systems

### B. Cotton/synthetic Jacket rubber lined hose

1. A circular woven jacket of cotton and synthetic fiber
  - a. Single Jacket
    - i. Lighter weight for wildland applications
  - b. Double Jacket
    - i. More durable for non-wildland applications
2. Sizes from 1 inch to 5 inches
3. Factory tested to 450 psi.
  - a. Maximum working pressure

### C. Booster Hose (Hard Line)

1. Rubber lining with in several layers of fibers with a rubber covering

2. Very heavy compared to other types of the same size hose
3. Very durable and resistant to heat, chemical, and mechanical damage
4. High friction loss in the standard 3/4 inch size
5. High working pressure of 600 psi.

D. Synthetic Jacket Hose (light weight, Hotline)

1. Light weight synthetic jacket
2. Liner is a thin plastic fused to the jacket
3. Very light weight
4. More susceptible to heat and abrasion than cotton jacket hose
5. Some jackets are slippery and may not hold in packs well
6. Double jacket is available
7. Factory tested to 450 psi
  - a. maximum working pressure

E. Hard Suction

1. Used for drafting
2. Should with stand 25" hg (vacuum)
3. Wire spiral with reinforced rubber or transparent plastic
4. Available in various lengths and sizes from 1 inch to 6 inches

III. Causes of fire hose damage

A. Mechanical Damage

1. Indicated by worn spots, rips, abrasions and crushed or damaged couplings or cracked expansion rings
2. Processes of common damage
  - a. Dragging hose over sharp or rough objects
  - b. Vehicles driving over unprotected hose line
  - c. Water hammer
  - d. Excessive engine pressure
  - e. Couplings crushed by vehicles
  - f. Not repacking hose at a minimum of once a month or repacking hose with the bends in the same locations

B. Heat Damage

1. Hot material or flame contacting the jacket
2. Heat damage from drying on hot pavement

## C. Mildew Damage

1. Hose remains wet for a long period resulting in the growth of mold and mildew that break down cotton fibers
2. Common when wet hose is stored for the winter

## D. Chemical damage

1. To a varying degree all hose is susceptible
2. Most common chemicals effecting hose on the job
  - a. Gas and diesel
  - b. Oil
  - c. Foam concentrate
3. Solar damage
  - a. Ultra violet light will break down fibers with prolonged exposure
  - b. Do not dry or store hose in direct sunlight

## IV. Care of fire hose

## A. On the fire line

1. Avoid laying hose over sharp objects or corners
2. Use hose bridges to protect from damage by vehicles
3. Avoid water hammer, may burst hose
4. Avoid dropping or dragging couplings
5. Avoid using excessive engine pressures
6. Keep hose out of hot areas or areas that may soon burn
7. Keep hose well away from dozers

## B. At the station

1. Replace wet or dirty hose as soon as practical
2. Clean hose with water and as little soap as possible
3. Dry hose before rolling and storing
4. Repack hose packs and hose lays within 30 days
  - a. Relocate bends in hose to when repacking packs or lays
5. Clean hose contaminated with chemicals immediately
6. Thoroughly rinse hose after washing

## C. Drying hose

1. Use a hose rack or drying tower - do not dry on hot pavement
2. Do not dry hose in direct sunlight to avoid solar damage

#### D. Storage

1. Hose jacket should be completely dry before storage
2. Store with rubber lining slightly damp
3. Stored hose has been inspected, tested, washed, dried, and rolled
4. Store hose in well-ventilated area out of direct sunlight

#### V. Testing hose

##### A. Test hose regularly

1. At least annually
2. After use
3. After recoupling
4. After freezing

##### B. Test procedures

1. Lay out hose with no more than 300 ft. of hose in any one line to be tested
  - a. Multiple lines may be tested but each should not be over 300 ft. in length
  - b. Remove any kinks
2. Mark the hose at the coupling
  - a. Use a pencil line
  - b. Allows the tester to see if couplings have slipped while testing
3. Fill hose with water
  - a. Expel all air from hose
4. Close Nozzle
  - a. Check for leaks at nozzle or couplings
  - b. Replace gaskets if necessary
5. Slowly raise pressure to test pressure
  - a. 300 psi. for most I.A. hose
  - b. Hold test pressure for 3 minutes
  - c. Keep all personnel away from hose being tested
  - d. Recoupled hose should be retested at a test pressure of at least 50% greater than the service test pressure. ie. 450psi.
6. Check all lines visually
  - a. Walk only down left side of hose when checking
    - i. Left side is determined by standing at test device looking toward nozzles

- b. Stay at least 15 feet away from hose
- 7. Reduce pressure and drain lines
  - a. Check couplings at this time for slippage
  - b. Slippage occurs most often on recoupled hose
- 8. Refer to Water Handling Equipment Guide or NFPA 1962, Care use and Maintenance of Fire Hose for further instructions.

## VI. Hose Couplings

### A. Care and maintenance of couplings

- 1. Avoid dragging or dropping
- 2. Keep vehicles from driving over couplings
- 3. Clean threads of all dirt and debris
- 4. Lubricate swivel as needed with graphite
- 5. Inspect and replace gaskets as needed
  - a. Remove gasket and bend double to look for cracks
  - b. Inspect couplings as hose is being stored

### B. Threads

- 1. Numerous thread types across the country
- 2. National Hose Thread
  - a. NH or NHT
  - b. Standard for USFS 1 1/2 or larger hose
- 3. National Pipe Straight Hose
  - a. NPSH
  - b. Standard for USFS 1 inch hose
- 4. Threads of common hose types

Size	Threads per inch	Thread type
3/4"	11.5	NH or Garden Hose (GH)
1"	11.5	NPSH
1"	8	NH or Chemical
1 1/2"	11.5	NPSH
1 1/2"	9	NH
2 1/2"	7.5	NH
4"	4	NH

5. Higby Cut
  - a. End of first thread is removed
  - b. Facilitates faster coupling
  - c. Reduces cross threading
6. Gaskets
  - a. Rubber gasket is required for couplings with straight thread.
  - b. Check gaskets by bending in half and checking for cracks